N.A.C.A. BULLETIN

In Two Sections

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EDITORIAL DEPARTMENT NOTE

Variance disclosure and analysis climaxes standard cost procedures by leading the way to causes of nonstandard performance. When and in what manner variances shall be recognized and acted upon are matters for determination in each case. The first article in the present issue spells out the variance determination procedures of a company manufacturing three lines of sheet iron products with common parts and processes.

The author of the article is ROBERT W. LEAVITT, now a member of the staff of the Director, General Accounting Department, Ford Motor Co. Mr. Leavitt, who is currently in charge of procedural matters pertaining to general accounting, came to Ford from four years' service as Chief Cost Accountant and Member of the Budget Committee, Buhl Manufacturing Co., Detroit, Mich.

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Office costs are an item of consequence in companies in all size ranges. The second article in this issue presents proposed standards of measurement of functional unit costs in the office, prepared with the needs of small companies in mind.

The presentation is written by JOHN J. RUSTER, Chief Accountant of the Revertex Corp. of America, Brooklyn, N. Y., since 1936. During 1944 and 1945, Mr. Ruster was in military service in the Pacific area. Since returning, his activities have included development and integration of cost and general accounting systems of three new subsidiary companies.

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The field of cost determination and control in construction contracting is one of widespread interest and also one in which the cost accountant is likely to encounter operational difficulties in securing his information as promptly—or as completely and accurately—as is desirable. Our third article describes a practical cost reporting and accumulation procedure applicable to small and large contracts.

MICHAEL J. MAZUR, the author, is Accountant and Office Manager for the L. H. Swenson Co., Poughkeepsie, N. Y. He first went with his company in 1941 as Junior Accountant and was subsequently employed by the New York Central R. R. and the New Jersey Shipbuilding Co. He returned to his initial employer in his present capacity in 1945.

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Radio broadcasting still attracts the interest usually associated with entirely new lines of endeavor and is an industry with which almost everyone has some contact. The final article in this issue of the *Bulletin* presents a method of holding departmental expenses of a broadcasting station in line with revenues. The technique is a practical adaptation of flexible budgeting for the purpose.

GERALD W. SWANK, the author of the presentation, is Controller of the Peoria Broadcasting Co., Peoria, Ill., with which he has been connected since 1939. Previous to that time, Mr. Swank was Branch Accountant for a large tea company for a seven-year period.

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MAY 1, 1948

MATERIAL AND LABOR VARIANCE PROCEDURE IN A SHEET METAL PRODUCTS PLANT

By ROBERT W. LEAVITT,
Staff of Director, General Accounting Dept., Ford Motor Co., Dearborn, Mich.

MUCH has been written about standard material and labor costs and the computation of material and labor variances from standard. However, I have not as yet read or heard of a method of computing variances which would fit the needs or problems of a medium-sized manufacturing company with which I am familiar. It has occurred to me that there may be other companies with similar problems. The method of handling them outlined in this paper may be of value.

Different Products; Common Operations

First of all, let us consider the type of manufacturing operations that we are dealing with. The company I have reference to employs approximately 1,400 hourly rated employees and manufactures four entirely different lines of products, namely, dairy metalware, bus seats, an electric ironer, and an electric or gas clothes drier. In addition, they fabricate various automotive parts which require primarily stamping operations. Many different types of processes are involved in the manufacture of these products. They are indicated briefly in the following paragraphs:

1. *Dairy Metalware*—This is the company's own product, which it has made for many years, and the line consists of many types and sizes of milk cans, ice cream cans, milk pails, and allied dairy metalware products. The types of operation are *shearing, stamping, welding, assembling, tinning, and soldering.*

2. *Bus Seats*—The basic development of this product originated with the company, but it is more or less of a custom-build proposition. Seats are made up in sets. However, the principal differences in the sets are the upholstery specifications, type of grab rails and arm rests, and the seating plan of the bus. By seating plan, we mean the respective numbers of one, two, three, four or five passenger seats required for each bus. Many of the parts making up the frame of the seat are interchangeable. The

Form 291 — Rev. 10-47 — 2500

PARTS COST RECORD

MATERIAL ONLY

PART No. 1YY59

PART NAME PANEL

CUSTOMER

ORDER No.

PAGE No. 1

DATE 1947	OUR ORDER NO.	VENDOR	DESCRIPTION	STEEL POUNDS	STEEL COST PER CWT.	AMOUNT	PCS.	ACTUAL UNIT COST PER M PCS.	STANDARD COST POUNDS	STANDARD COST UNIT COST PER M PCS.	STANDARD COST AMOUNT	VARIANCE AMOUNT
	B	Blank Steel Co.	1Ygn 36 x 1Y8 HR	6000	3.75	Y Y5 00	5500					
	B	" " "	1Ygn 36 x 96 HR	Y000	3.50	70 00	1000					
	B	" " "	1Ygn 36 x 96 NAX	Y750	5.Y Y5	143 69	Y500					
				10750		438 69	10000	43.87	10000	35.00	350 00	88 69
			USAGE VARIANCE	- 750	lbs. @	$3.50	CWT.					Y6 Y5
			PRICE VARIANCE	-6000	lbs. @	¢ .Y5	CWT.					15 00
			"	- Y750	lbs. @	¢ 1.7Y5	CWT.					47 44
												88 69

EXHIBIT 1

operations involved are: *shearing, stamping, welding, painting, and assembling.*

3. *Electric Ironer and Drier*—These products were developed by the company's customer for this line and are manufactured to its specifications. They are two entirely different products but involve the same type of processes such as, *shearing, stamping, welding, painting, metal finishing, and assembly.*

As you can see from the above brief description, the products are entirely different but have many types of operations which are common. They are also highly competitive items and it is very important that the company have the actual cost information, as compared to standard costs, available for control and cost reduction purposes.

Accumulation of Actual Material Costs

We will deal first with material costs. One of the things common to the above products is that they use sheet steel and many of the sizes and gauges of steel used are likewise common to all products. There is no attempt made to charge off any price variance when the steel is billed, and so the steel is carried in inventory at actual cost until such time as it is used. This is done for various reasons, as follows:

1. Many of the sheet sizes and gauges are common to all products and different standard costs may be set up on various products which use a common size sheet.
2. Sheet sizes may be substituted due to temporary shortages. If the price variance was written off at the time of receipt of the material, an additional price variance might have to be written off upon use.
3. Under present-day conditions, steel retains its market value as long as it is not fabricated and is easy to dispose of. There is, therefore, no justifiable reason for writing down its value at the time of purchase.

As the steel is withdrawn from stores and put into production, a material requisition is issued. This requisition shows the number of pounds used, the gauge and sheet size, number and name of the part it is to be used for, the vendor's name and purchase

PART NO. 1YY59
PART NAME PANEL
CUSTOMER
NO. REQ.

STANDARD MATERIAL COST

USED ON MODEL D IRONER PAGE NO. 1

STEEL

DATE EFFECTIVE	GAGE THICKNESS	SHEET SIZE	SPECIFICATION	POUNDS REQ. PER M PIECES	PRICE PER CWT.	STANDARD COST PER M	
8-1-47	(14) .1093	36" x 96"	HRP&O	1000	$3.50	$35.00	

REMARKS

OUTSIDE WORK

DATE EFFECTIVE	DESCRIPTION	STANDARD COST PER M	DATE EFFECTIVE	DESCRIPTION	STANDARD COST PER M

REMARKS

EXHIBIT 2

order number, and the number of pieces of the part to be made. The requisition is sent to the accounting department where it is priced on a first-in, first-out basis. It then goes to the cost department, where it is posted to a "Parts Cost Record" (Exhibit 1). The information posted is as follows:

1. Date
2. Production order number
3. Vendor
4. Gauge, sheet size, specifications
5. Pounds used
6. Cost per hundredweight
7. Number of pieces

At the end of the month, the requisitions posted to each part are summarized on the "Parts Cost Record" to arrive at the total pounds used, total cost, average cost per hundredweight and total cost. A computation is then made to arrive at actual cost per thousand pieces.

Standard Costs of Materials

The material standards are recorded for each part in the following manner, using the figures given in Exhibit 2, Standard Material Cost:

EXHIBIT 2

Part 12259—Panel

1,000 lbs., 12 ga. 36 x 96 H.R., P. & O. @ $3.50 cwt. = $35.00 per M pieces

In other words, 1,000 pounds of the specified size is the standard usage to make 1,000 pieces. The standard price (cost) is $3.50 cwt., or $35.00 per M pieces. In all cases, the standard price (cost) per hundredweight and the sheet size are in agreement with the price and size used in arriving at the selling price of the product.

Determination of Material Variances

Material variances are computed only at the end of the month although the information is available the day after the part is put into production. This is done to eliminate the necessity of computing the variance on individual requisitions and consequently saves much detail work.

Material variances are computed in the following manner:

STANDARD LABOR COST

PART NO. 1XX59
PART NAME PANEL
CUSTOMER
NO. REQ. 1

PAGE NO. 1 USED ON MODEL D IRONER

OPERATION NAME	OPER. NO.	DEPT.	STD. TIME	RATE PER HR.	STANDARD LABOR COST PER M — DATE EFFECTIVE 8-1-47	DATE EFFECTIVE	DATE EFFECTIVE	DATE EFFECTIVE	DATE EFFECTIVE	DATE EFFECTIVE
SHEAR	10	A	.007	$1.36	$2.72					
BLANK	20	BY	.003	1.36	4.08					
NOTCH	30	BY	.013	1.36	17.68					
PIERCE 4 HOLES	40	BY	.013	1.36	17.68					
WRAP	50	T	.033	1.36	44.88					
SPOT WELD	60	T	.035	1.40	49.00					
TOTAL					$136.04					

REMARKS

EXHIBIT 3

1. Suppose, for example, we used 1,200 lbs. of 12 ga. 36 x 120 @ $4.00 cwt. to make 1,000 pieces, instead of 1,000 lbs., 12 ga. 36 x 96 @ $3.50 per cwt.

1,000 lbs. 12 ga. 36 x 96 @ $3.50 cwt.	=	$35.00
1,200 lbs. 12 ga. 36 x 120 @ $4.00 cwt.	=	48.00
Material Variance		$13.00

2. The variance of $13.00 consists of both a price variance and a usage variance. The variance can then be broken down as follows:

200 lbs. @ $3.50 cwt.	=	$ 7.00 Usage variance
1,200 lbs. @ $ .50 cwt.	=	6.00 Price variance
		$13.00 Total variance

After computing the variances for all parts for the month, the variances are summarized by part number and product line and the total variance is charged to material variance accounts set up for each product line. Material variance accounts appear on the income statement as an item of cost of sales. All of the above computations are done on the "Parts Cost Record," as shown in Exhibit 1. In this way, information on every part is readily available in one place.

Time Studied Labor Standards

We come next to the method of computing direct labor variances. Because of the fact that many of the departments in the factory perform within the department work for several different types of operations, it was not deemed advisable to try to compute direct labor variances on an over-all departmental efficiency basis. It was desired by management that variances be computed on each operation for each part or assembly manufactured. Accordingly, time studies were made on each operation and a standard time element set up. The standard time was then converted into dollars by multiplying the standard time by the labor rate that the particular operation carried (Exhibit 3). From there on, the cost department concerned itself only with dollar costs per M pieces for each operation. These dollar standard costs were then compared with actual dollar costs to arrive at the variances.

FORM 288

OPERATION COSTS

MONTH	OPERATION NAME AND NO.			OPERATION NAME AND NO.			OPERATION NAME AND NO.			OPERATION NAME AND NO.			OPERATION NAME AND NO.			OPERATION NAME AND NO.		
AUG.	SHEAR		(10)	BLANK		(70)	NOTCH		(30)	PIERCE & HOLES		(40)	WRAP		(50)	SPOTWELD		(60)
DAY	HRS.	COUNT	AMT.	HRS.	COUNT	AMT.	HRS.	COUNT	AMT.	HRS.	COUNT	AMT.	HRS.	COUNT	AMT.	HRS.	COUNT	AMT.
1																		
2	70.5	5000	77.88															
3	73.6	5000	37.10															
4				37.9	9950	44.74												
5							17.8	9900	17.41	17.8	9900	17.41						
6																		
7													34.9	9500	47.16	8.0	1450	11.70
8																8.0	1500	11.70
9																8.0	1475	11.70
10																8.0	1481	11.70
11																8.0	1300	11.70
12																8.0	1544	11.70
13																3.8	650	5.37
14																		
31																		
TOTAL	44.1	10000	59.98	37.9	9950	44.74	17.8	9900	17.41	17.8	9900	17.41	34.9	9500	47.16	51.8	9400	77.57
ACTUAL COST PER M			6.00			4.49			17.58			17.58			50.47			77.19
STANDARD COST PER M			3.77			4.08			17.68			17.68			44.88			49.00
TOTAL VARIANCE AMT.			22.78			4.14			(.09)			(.09)			1.74			28.19

TOTAL VARIANCE - ALL OPERATIONS 55.44

ORDER NO 8 QUANTITY 10000 PART NAME PANEL PART NO. 1775 MONTH AUGUST 1947

EXHIBIT 4

Monthly Labor Variances By Operations

The company employs timekeepers in all departments who record the amount of time worked on each operation for each part as well as the number of pieces produced, using a keysort card. The keysort cards are sent to the payroll department each morning for the preceding day and are extended. The earnings for each employee are then posted to a payroll summary card. The keysort cards are punched and sorted by product lines, part number, and operation number. On the morning of the second day, the sorted cards are distributed to designated clerks in the cost department who post to an Operation Costs sheet (Exhibit 4), the number of hours, pieces produced, and amount.

The operation cost sheets have identical columns on each side headed Operation Name and No. and sub-headed Hrs., Count, and Amt. There are thirty-one lines running horizontally across the sheet, numbered on the left-hand margin. The numbers designate the date the work was performed. At the bottom of the columns, a total space is provided and space is also provided for Actual Cost per M, Standard Cost per M, and Total Variance Amt. At the end of the month, the columns are added to arrive at total pieces produced per operation and total amount paid. The actual cost per M is then computed and the difference between the actual and standard cost per M pieces for the total pieces produced represents the variance on that operation for the month.

The labor variances are then summarized by product line and part number and charged to a labor variance account which, as with material variances, is classified as cost of sales on the income statement. Any unusual labor variances noted during the month are referred to the time study department for investigation.

Satisfactory Results With Small Staff

The above method of recording costs and computing variances has given very satisfactory results, as it provides all the information necessary to point out to management which operations or parts require special attention to reduce costs to standard, as well as providing a direct comparison of actual costs against standard. This information has proven of inestimable value in reviewing selling prices and establishing prices for service parts, etc. All of the above detail is accomplished by four cost clerks, each of whom handles one product line, i.e., one clerk handles all details concerning bus seats, one clerk handles dairy metalware, one clerk

handles the ironer, and the other clerk handles the drier. In addition, these clerks prepare the cost of sales, which is costed at standard.

Control of Scrap Reporting

Another advantage of the system of recording labor costs is that it provides a means of checking the accuracy of counts and also of determining whether or not all scrap made is being reported. A brief indication of the production order procedure will bring this point out. The production department issues production orders each month for a specified quantity of each part required for the month. Each production order carries a number which identifies the lot through the various operations in the shop. Also, at the beginning of each fiscal year, production orders are issued specifically applicable to all parts in inventory. These orders cover the operations required to carry each part from the stage that it is in at inventory time to completion. The production order numbers consist of letters of the alphabet prefixed to the part number. The first order for the year for each part will bear the letter "A" and subsequent orders will be designated "B," "C," "D," etc. The full order numbers will appear thus: A-12345, B-12345, A-12559, B-12559, etc. The timekeepers identify each run by order number and report the time for each order number and part number. The postings to the operation cost sheets are then made by order number.

The cost department receives copies of the production orders and in this way is advised of the quantity of pieces to be made on the order. When the order is put into production, the cost department checks the count on the first operation against the order to see that it is reasonably close to the quantity called for. It is a rare instance when these counts will agree exactly, but if they are within 10 per cent, it is considered satisfactory. After the first operation is complete, it is then possible to check the counts on subsequent operations as, of course, they cannot logically exceed the first operation count and, if they do, will call for immediate investigation. Subsequent counts less than the first operation should be covered by scrap tickets to make up the difference. In this way, the operation cost sheets serve to help in checking counts. More accurate costs result because of this control.

DETERMINING COSTS OF CLERICAL FUNCTIONS IN A SMALL OFFICE

By JOHN J. RUSTER,
Chief Accountant, Revertex Corp. of America, Brooklyn, N. Y.

THE articles by P. A. Lawrence and H. F. Van Gorder in the July 15, 1947 and September 15, 1947 issues, respectively, of the *N. A. C. A. Bulletin* have dealt very ably with the subject of clerical costs as it applies to larger organizations. However, what can be said to help the individual with a staff of twenty to fifty persons who cannot get the appropriation or find the time for an elaborate survey of methods and or for job evaluation? Quite often he has a superior who is in the habit of asking why the office is costing so much to run today. In many cases there is no concrete information at hand to stand as evidence for the need of current (and possibly increased) outlay. Nevertheless, with a few hours' work, basic data can be compiled which will be of incalculable value in assaying present performance, setting standards, and planning future operations.

Three Steps; Three Cost Elements; Three Clerical Functions

The process involves merely (1) the division of clerical and accounting work into a few major functions, (2) establishing a measurement of the volume of work for each function, and (3) allocating the elements of *clerical salaries, direct expenses,* and *office overhead* to those functions. The survey described here divides clerical work into three major functions:

1. *Accounts receivable,* including all clerical work from receipt of customer's order to the entry of the sales invoice and the processing of the customer's check.
2. *Purchasing,* which comprises all clerical work from receipt in the office of a purchase requisition to the payment of vendor's invoice.
3. *Payroll (including timekeeping),* covering preparation and disbursement of the payroll and the keeping of all payroll-connected records and reports.

It will be noted that I have not set out cost records separately. How much do costs cost? The author likes to think that in his

case the cost is nil because cost and other operational reports are completely integrated with the general books so that these reports come out as a by-product at an additional cost which is insignificant. However, the survey outlined here can be easily modified to give separate recognition to the cost accounting function where it is not so completely integrated with the conduct of accounting as a whole.

Serially Numbered Documents Offer Volume Basis

The volume of clerical work performed in any given period can be determined instantly by reference to the first and last of any numbered series of documents used during the period, such as sales invoices or credits issued, purchase orders, purchase vouchers, production orders, and checks issued. The number of individual payments received during the period can be ascertained from the cash receipts book. The number of active accounts receivable and accounts payable should also be determined periodically, noting the number of accounts showing balances as well as the total number on the books.

In selecting measurement bases for specific functions, the overlap between sales orders and shipments invoiced, purchase orders placed and vendors' invoices received and processed may be ignored. In the normal course of business this overlap is not material enough to distort the resulting unit cost figures. The cost of handling accounts receivable has, therefore, been measured by the number of sales invoices and credits rendered, while the purchasing function has been measured by the number of purchase vouchers entered.

The cost of payroll preparation is measured directly by the number of employees on the payroll, using an average if fluctuations are considerable.

Allocating Wages and Hours to Functions

The companion step to selecting function volume bases is to schedule the total number of clerical employees, their hours worked, and their earnings for the period covered. For purposes of data control they are first listed by job classifications (general clerk, bookkeeper, etc.), then by function (accounts receivable, purchases, payroll, etc.). At this point we may occasionally have to be somewhat arbitrary. An example of this would be an inventory-record clerk who records purchases and receipts of ma-

terials and also processes and records requisitions for withdrawals from stock. In allocating his time and earnings by use of elapsed serial numbers of documents, we have to bear in mind that each purchase order generally covers one shipment of one kind of material, whereas a stores requisition may cover a list of eight to twenty different materials. Exhibit 1 shows the initial summary of clerical work hours and earnings as prepared from the payroll records and serving as a work sheet.

CLERICAL WORK SUMMARY

Month of.....

(Working days: 22)

Classification	*Number of persons*	*Hours*	*Earnings*	*Function*	
Accountant and auditing clerks	3	528	$1100.	General	
Bookkeepers	6	1040	1170.	Ac. Rec.—4 Ac. Pay.—2	
General and order clerks	4	704	620.	Ac. Rec.—3 Ac. Pay.—1	
Billing clerks	3	528	528.	Ac. Rec.	
Purchasing dept.	3	528	860.	Ac. Pay.	
Factory office (Inventory records)	2	352	340.	Ac. Pay. Stores Requ.	} Allocated
Timekeeper ..... Payroll clerks ..... Personnel	1 2 1	700	800.	Payroll	
Total worked	25	4380	$5418.		
Lost time	x	20	18.		
Total paid	25	4400	$5436.		

EXHIBIT 1.

Unit Costs In Wage Dollars and Man Hours

Exhibit 2 goes on to show the allocation of hours and earnings to the specific major functions and the determination of unit salary costs by applying the measure of work volume selected. Unit costs are computed in man hours as well as dollars and the man hour unit is perhaps the one to emphasize most as it serves to disclose the effect on costs of office functions of variations in salary rates and makes possible a comparison of relative efficiency in different periods.

To make such a comparison valid, the man hours listed should be hours *worked*, eliminating holidays, time lost, etc. In making

CLERICAL WORK COST ANALYSIS

Month of.....

(Working days: 22)

Function	*Number of persons*	*Hours*	*Earnings*	*Unit hours*	*Cost* $
Accounts Receivable					
Order and genl. clerks....	3	528	$ 470.	.383	.340
Billing clerks	3	528	528.	.383	.383
Bookkeepers	4	704	780.	.510	.565
Total	10	1760	$1778.	1.276	1.288
(Activity basis: Number of sales invoices and credits..... 1380)					
Purchasing					
Purchasing dept.	3	528	860.	.577	.940
Factory clerks	2	352	340.		
less: handling of stores requisitions		(200)	(200.)	.166	.153
Bookkeepers	2	336	390.	.367	.426
General clerk	1	176	150.	.192	.164
Total	8	1192	$1540.	1.302	1.683
(Activity basis: Number of purchase vouchers..... 915)					
Stores Requisitions					
Factory clerks		200	$ 200.	.889	.889
Payroll					
Personnel	1				
Timekeeper	1	700	800.		
Payroll	2				
Total	4	700	$ 800.	.778	.89
(Activity basis: Average number of employees on payroll.... 900)					
Accounting and Auditing					
Accountant and audit clerks	3	528	$1100.	Allocated to functions as overhead.	

EXHIBIT 2

such comparisons it is very important that each function be clearly defined and that the items be comparable. The payroll function in the illustration given, for example, includes the handling of group insurance deductions and benefits, U. S. payroll savings accounts, and accommodation sales of gasoline and oil to employees, as well as the preparation of the payroll itself and the keeping of earnings and personnel records. If new functions are added to any of the major divisions, this must be borne in mind when comparing operating costs with those of previous periods.

WORK SHEET FOR ALLOCATION OF ACCOUNTING DEPARTMENT EXPENSE

1. *Direct Cost of Supplies and Postage per Thousand Sets*

*Accounts Receivable**

Invoice forms (quadruplicate)	$30.76
Shipping orders (quadruplicate)	20.00
Bills of lading (triplicate)	14.52
Envelopes	8.00
Postage	30.00
Total per thousand orders	$103.28

* Comparable data prepared for other functions.

2. *Other Direct Costs*

Payroll taxes, workmen's compensation, and public liability insurance	4.2% on Payroll

3. *Balance of Overhead* (Basis of allocation: Rate per direct working hour)

Rent (or cost of space if owned, including light, heat, janitor service, share of telephone bill)	$ 200.00
Salaries—Accounting and audit clerks	1,100.00
Payroll taxes and insurance	36.00
Supplies, ledgers, journals (one-twelfth of one year's supply of all supplies not specifically chargeable on unit basis)	60.00
Total	$1,396.00
Scheduled working hours:	
22 direct work employees @ 160 hours	3,520 hrs.
Overhead rate per hour	$.397

EXHIBIT 3

Accounting Department Overhead

Next comes the subject of overhead which in the accounting department can be divided into three groups as illustrated in Exhibit 3:

1. *Direct cost to each function of supplies and postage.* This can be expressed on a unit cost basis. The scheduling of this class of costs provides a good opportunity to look over methods of control and internal check, something we often think about but seldom find the time to do. On this occasion we may find some correction of procedure indicated or some superfluous form which might well be eliminated.

The upper portion of Exhibit 3 shows a schedule listing of the forms applicable to the handling of a sales order, the cost per thousand of each form, and postage taken at a flat three cents per order. If confirmation of orders are sent to the customers, this particular item would have to be doubled. Only items pertaining to specific steps in sales transactions

are considered at this point. The costs of ledgers and journals are taken as a period charge as will be shown below. A similar schedule is prepared for direct supplies cost of other functions. For payroll this would include listing of clock cards, work sheets, earnings statements (and any other form or supply item which may be used) for *each* employee for *each* payroll.

2. *Other direct costs* which vary with the office payroll dollar. These include payroll taxes, workmen's compensation, and public liability insurance. The figure of 4.2 per cent is used in the illustration to allocate such costs on a payroll dollar basis.

3. *Overhead not directly related to work volume or payroll dollars.* Exhibit 3 lists rent, supervisory salaries and payroll taxes thereon, and supplies chargeable on a period basis. The latter include ledgers, journals, binders, as well as the maintenance of office equipment. This expense group could be allocated to functions on a percentage of direct payroll basis. However, the resulting figures will be more useful in future periods if allocation is kept on an hourly basis, thus eliminating the gyrations of salary rates from the picture.

There is a definite relationship between the number of hours of direct work as a function of the number of clerical workers and the item of rent for the space used by them, on the one hand, and the item of supervision and auditing on the other hand. This relationship is emphasized by allocating this overhead group on the basis of a rate per direct work hour. In the illustration this was done by extending the number of direct workers by the scheduled monthly hours per worker and dividing the total hours into the total overhead expense, obtaining a rate per direct work hour.

Full Cost of Clerical Functions

With the distribution of overhead to functions, the preliminary work is complete and a summary can now be assembled for each function, as shown in Exhibit 4, Clerical Cost Report, which again takes the example of the clerical costs relating to sales. Here we bring over the direct salary cost from Exhibit 2 and fill in the item of payroll taxes and insurance based on the direct salary

CLERICAL COST REPORT

Function: *Sales and Receivables Accounting*

Activity Data: Invoices 1,230, Credits 150, Total 1,380 Month .....

		Cost	
		Total	*Unit*
Direct salary cost	1,760 working hours	$1,778.00	$1.288
Direct supplies	@ $.103 (per M. invoices)	142.14	
Payroll taxes and insurance	@ 4.2% (payroll $)	74.68	
Supervision and overhead	@ $.397 (per working hr.)	698.72	
Total supplies and overhead	(equals $.520 per hr.)	915.54	.663
Total cost		$2,693.54	$1.951

EXHIBIT 4

dollars. Next we extend the number of invoices and credits processed during the month by the unit cost for direct supplies. Finally we apply overhead on the direct work hours.

Now we add it all up, figure the unit cost, and perhaps pause to reflect: "Who would have thought it cost us that much to handle an order"? Moreover, what we have is only the *clerical* cost. If you are not too discouraged by what you see, you can go on and figure out a unit cost for the sales department, allocating salesmen's salaries and expenses, and, in respect of the paper work of the purchasing function, a factor for the men who sign the checks, etc. However, such factors have been deliberately placed beyond the scope of this article, which is intended to demonstrate a method for computing unit costs for clerical functions usually performed in or about the accounting department.

If, for purposes of comparison, the report illustrated in Exhibit 4 is made up for some past period also—say 1936—it will almost surely be found that not all of the rise in cost is due to wage rate increases. The unit cost in hours will probably be found to have gone up. This increase may be ten to fifteen per cent or more. Perhaps the time has come for installing office incentives all around. Certainly office efficiency has not been going in the same direction as rates of pay during recent years. On the other hand, this survey may, in your case, show an improvement in man hour unit costs over the years and give you an opportunity to pat yourself on the back. Such a showing surely means that great improvements have been made in your methods and procedures.

Limitations and Sundry Uses of the Method Proposed

The office cost survey with which this article has dealt, while by no means exhaustive in its approach or findings or scientifically exact in a laboratory sense, compensates these limitations by being quickly assembled and it can be the basis for further study of methods in departments which appear to be operating at a high cost. Unfortunately not much literature is as yet available which would make possible comparisons of the data developed with that applicable to other firms of like size in the same industry although the need for this type of information certainly exists.

The facts brought out by this office cost analysis provide, as a secondary benefit, a valuable guide for allocating distribution costs, computing the average size of orders received, average number of orders per customer, cost per account handled, and numerous other uses which will suggest themselves and which will be of interest to the sales department and to management generally.

COMING ARTICLES

In the *N. A. C. A. Bulletin*, May 15, 1948

Accounting Progress—The Next Step
by Thomas M. Hill

Whither Accounting?
by Daniel Borth

A Case Against Flexible Budgeting
by Benjamin P. Hamilton

Cooperation of Line and Staff in the Development and Use of Costs
by Richard P. Swartz

DEVELOPING TOTAL AND UNIT COSTS BY TYPES OF WORK ON CONSTRUCTION PROJECTS

By MICHAEL J. MAZUR,
Accountant-Office Manager, L. H. Swenson Co., Inc.,
Poughkeepsie, N. Y.

THE principal purpose of cost accounting in the construction industry consists of the analysis of various classifications of work at actual cost to determine which classifications yield a profit and which result in a loss. By distributing actual labor and material costs to the various categories of work performed on a project, such as concrete construction, brick masonry, reinforcing steel, etc., it can be determined which category proved profitable and which unprofitable. By comparing these accumulations with the original estimate, it is possible to discover before the work is completed where "leaks" or losses occur, thus permitting remedial steps to be taken.

These cost accounting processes are effectual only with the full cooperation of the supervisory and timekeeping forces located at the job sites in supplying the cost accountant with adequate and sufficiently detailed weekly and monthly reports of all operations performed. If the records submitted are scanty and inaccurately kept, the picture of costs on the particular project is automatically out of focus and hence useless. Worse than this, the distortion will be reflected in estimates on future projects and, of course, will prove costly. There are various procedures in use for keeping costs on a project. Choice often depends upon the size of the project under construction. However, it has been found, through continuous use, that the cost system outlined in this article is flexible and will serve well for both large and small operations.

Labor: The Timekeeper's Records

In order to obtain accurate labor costs, it is necessary to subdivide the workmen's time each day, charging the total number of hours worked by the men on the project to the various classifications of work performed. On small jobs where there are not over fifteen or twenty men or where the project is of a nature that does not warrant a timekeeper, the carpenter or mason foreman should keep the time and, of course, the labor distribution, as these individuals are or should be the best informed as to the

WEEKLY PAYROLL

JOB Norman Building Repairs — Week Ending January 14, '48 — SHEET No. 1 — JOB NO. 4801-01

Occupation	Employee's Name	Empl. No.	8 T	9 F	10 S	11 S	12 M	13 T	14 W	Hours	Rate	Amounts	Deductions: Fed. O.A.B.	Deductions: Other Ded.	Balance Due
Mas Fr	John Dee		8	4	—	—	8		8	28	2.625	$73.50			
Mas	John Doe		8	4	—	—	8		8	28	2.375	66.50			
"	Dan Hughes		8	4	—	—	8	RAIN	8	28	2.375	66.50			
Carp Fr	Wm Johnson		8	4	—	—	8		8	28	2.25	63.00			
Carp	Fred Brower		8	4	—	—	8		8	28	2.00	56.00			
"	Chas Smith		8	4	—	—	8		8	28	2.00	56.00			
Lab	Jos Ponozio		8	4	—	—	8		8	28	1.375	38.50			
"	D. Garino		8	4	—	—	8		8	28	1.375	38.50			
"	D. Graziano		8	4	—	—	8		8	28	1.375	38.50			
"	Geo. Smith		8	4	—	—	8		8	28	1.375	38.50			
	Totals		80	40	—	—	80	—	80	280		$535.50			

EXHIBIT 1

LABOR DISTRIBUTION

Job Norman Bldg Repairs — Sheet No. 1-A

Class of Work Brickwork — Week Ending January 14, 1948 — Job No. 4801-01

Occupation	8 T	9 F	10 S	11 S	12 M	13 T	14 W	Hours	Rate	Amount
1 Common Brick										
2 Mason Foreman	8	4			8		8	28	2.625	$ 73.50
3 Masons	16	8			16		16	56	2.375	133.00
Total										$206.50

	Quantity Work in Place	Pay Roll Costs	Labor Average Unit Cost	Average Quantity Per 8 Hour Day	Quantity Work in Place	Pay Roll Costs	Labor Average Unit Cost	Average Quantity Per 8 Hour Day
Previous								
This Week	10 M	206.50	20.65	952				
Total	10 M	206.50	20.65	952				

EXHIBIT 2

work performed by the men. However, on projects where a timekeeper is employed, it is his primary duty to furnish the cost accountant with the afore-mentioned data.

The timekeeper's work shapes up in Exhibit 1, the weekly *gross* payroll (deduction and balance due columns may be ignored for present purposes) and, more important to costs, Exhibit 2, labor distribution, derived from Exhibit 1 separately for each type of work. It will be noted that the payroll form, which controls the dollar aggregate of the labor distribution cards, requires (and contains purely illustrative figures for) the total time as expended by all the workmen on all operations each day and the total pay earned for the particular week in question. Exhibit 2 illustrates labor distribution in terms of the total time and cost expended on brickwork as well as the total amount of brick laid during the payroll period. It also contains the average unit cost per 1,000 bricks laid, and, likewise, the average quantity of brick laid for an eight hour day.

Another distribution card would show the time spent, as well as the cost of, setting and stripping forms. It, too, calls for quantity and unit data, i.e., the number of square feet of forms set, cost per square foot of forms, and the average quantity set per day. Similar information is given on the stripping of forms. The card for pouring concrete would disclose the time spent and the cost of pouring concrete in the forms for foundation work with corresponding cost and quantity data.

Exhibits 1 and 2 are the timekeeper's (or job foreman's) records and are kept on the job site. The back of Exhibit 2 provides for certain comparative control data for successive weeks. These two forms are presented to the cost accountant only at the completion of the project, to be used as supporting data for costs established from analysis developed on the books from Exhibit 3, summary Weekly Labor Distribution report, prepared on the job but presented each week to the cost accountant for posting to his records. It will be seen quite readily that the weekly report is an assembled summary of costs as shown by Exhibit 2 for each phase of the construction work in process during the week. From this distribution, the cost accountant is informed just what classifications of work performed have cost applicable to them as well as the total cost to date applicable to each classification.

Labor Distribution Report

Job No. 4801-01 Report No. 2

Name of Work Norman Building Repairs Location 507 Main St. Sheet No. 2 Date Jan. 14, 1948

Class Of Work	*Occupation*	*Total Hours*	*Rate*	*Amounts*	*Total Cost*	*Total Cost to Date*	*Quantity Work Placed*	*Unit Cost*	*Total Quantity Wk in Place*	*Av. Unit Cost To Date*
General Conditions	Superintendent			$	$	$ 60.00				
Common Brick	Mason Foreman	28	2.625	73.50						
	Masons	56	2.375	133.00	206.50	206.50	10000	20.65	10000	20.65
Setting Forms	Carpenter Foreman	20	2.25	45.00						
	Carpenters	40	2.00	80.00						
	Laborers	40	1.375	55.00	180.00	180.00	3500 sq ft	.05 1/10	3500 sq ft	.05 1/10
Stripping Forms	Carpenter Foreman	8	2.25	18.00						
	Carpenters	16	2.00	32.00						
	Laborers	32	1.375	44.00	94.00	94.00	3500 sq ft	.02 6/8	3500 sq ft	.02 6/8
Placing Ready Mix Cover	Laborers	40	1.375	55.00	55.00	55.00	18 cu yds	3.05	18 cu yds	3.05
	Totals	280			$535.50	$595.50				

Note: 1/13/48. Rain no one reported for work. 1/9/48. All men failed to report for work 1° below zero. All reported at 12:30 p.m., weather conditions at 30° F permitting bricklaying.

Foreman John Doe

Exhibit 3

Accumulating Labor Costs

With the week's spread provided by Exhibit 3 as his basis, the cost accountant picks up the work and enters the weekly cost applicable to each classification in his labor cost record which is illustrated by Exhibit 4. Of course, the labor distribution should be checked against the payroll to see if the two are in balance before any steps are taken to post these costs. The labor cost record illustrated by Exhibit 4 is the summarization of labor costs, as incurred weekly, by the various classifications of work performed. At the completion of the project, after analysis, it gives the final cost of each classification of work performed as well as the final unit cost in each category. It is the significant record of actual cost. Its use as a subsidiary record governed by the record of the project in the general books, controlling both material and labor, and its further use to provide figures to compare with original job estimates, are covered after discussion of basic records for material costs.

In summing up the procedure of keeping labor costs on a project, one primary fact must be kept in mind. There must be nearly perfect coordination among the superintendent, gang foreman, timekeeper, and the cost accountant so that the cost accountant may be supplied with accurate and detailed records of the labor costs as incurred. The cost accountant should be delegated power to supervise the cost recording procedure and to see that it is properly carried out.

Purchasing and Receiving Procedures

The procedure of accounting for material costs is also one of coordination between the organization in the field and the cost accountant. All materials to be used on the project should be ordered by the superintendent or foreman in charge, the purchase order being prepared by the superintendent or by the timekeeper if there is one. However, all subcontracts should be placed with the subcontractor by an authorized person in the general office of the organization on the basis of formal signed contracts.

Upon receipt of the materials ordered, a delivery ticket should be procured from the vendor and a physical count of the material received should be made in order to determine whether all the material ordered has been received in good condition. All shortages should be noted on the delivery ticket and the vendor should be immediately notified. If all the material received is in good

Labor Cost Record

Name of Work Norman Building Repairs — Location 750 Main St. — Sheet No. 1

Architect or Engr. Smith & Smith & Assoc. — Owner J. F. Norman Co., Inc. — Job No. 4801-01

			Excavation			Erec. Concr. Found.			Remove Concr. Forms			Placing Concr.			Com. Brick			Gen'l Expense		
Date	Description	Total	Quan.	Unit Cost	Amt.	Quan.	Unit Cost	Amt.	Quan.	Unit Cost	Amt.	Quan.	Unit Cost	Amt.	Quan.	Unit Cost	Amt.	Quan.	Unit Cost	Amt.
1948		$	Cy.	$		Sq. ft		$	Sq. ft.		$	Cy.		$	M		$			$
Jan. 7	Payroll	160.00	25	.91	100.00													...	...	60.00
" 14	"	535.50				3500	.05 1/10	180.00	3500	.02 6/8	94.00	18	3.05	55.00	10	20.65	206.50	...	...	

Exhibit 4

Material Cost Record

Name of Work Norman Building Repairs — Location 750 Main St. — Sheet No. 1

Architect or Engr. Smith & Smith & Assoc. — Owner J. F. Norman Co., Inc. — Job No. 4801-01

			Foundations Forms			Ready Mix Concr.			Common Brick			Framing Lumber			Lime			Gen'l Expenses		
Date	Description	Total	Quan.	Unit Cost	Amt.	Quan.	Unit Cost	Amt.	Quan.	Unit Cost	Amt.	Quan.	Unit Cost	Amt.	Quan.	Unit Cost	Amt.	Quan.	Unit Cost	Amt.
1948		$	Sq. ft.			Cy.		$	M		$	Ft.		$	Bgs.		$			$
Jan. 2	The Builders Supply Co.	210.00	3500	4200	210.00													...	...	
5	Master Builders Co.	275.00							10	27.50	275.00							...	...	
12	Redi-mix Concr. Corp.	180.00				18	10.00	180.00										...	...	
14	Printers Supply Co.	5.00																...	...	5.00
15	J. Q. Lumber Company	280.00										2000	140.00	280.00				...	...	
15	Master Builders Co.	10.00													10	1.00	10.00	...	...	

Exhibit 5

GENERAL LEDGER JOB COST RECORD

Contract Account

Name Norman Building Repairs | Address 750 Main St. | Sheet No. 1

Name of Work | Location | Job No. 4801-01

FORM 1423 FRANK B. WALKER CO., PUBLISHERS, CHICAGO

Date 1948	Description	Folio	V	Contracts and Extras MEMO.	Credits to Contract MEMO.	Net Amount Contract MEMO.	Amount Completed DR.	Date Paid	Folio	V	Amount Paid CR.
1/2	Per Proposal of 12/15/47			82,752.50							

REVERSE OF FORM

Date 1948	Description	Folio Vol.	V	Labor	Material	Sub-Contracts	Misc. Expense	Total Cost DR.	V	Credits CR.
1/2	The Builders Supply Co.	1			210.00			210.00		
5	Master Builders Co.	2			275.00			275.00		
7	Payroll 1/7/48	3		60.00				60.00		
12	Redi-mix Concr. Corp.	4			180.00			180.00		
14	Printers Supply Co.	5					5.00	5.00		
14	Payroll 1/14/48	6		535.50				535.50		
15	I. Q. Lumber Company	7			280.00			280.00		
15	Master Builders Co.	8			10.00			10.00		

EXHIBIT 6

Job Comparison Statement

Name of Work Norman Building Repairs — Location 750 Main St. — Sheet No. 1

Architect or Engr. Smith & Smith & Assoc. — Date Aug. 15, 1948 — Job No. 4801-01

Date	Class Of Work	Estimated Quantity	Estimated Unit Cost	Estimated Total Cost	Actual Quantity	Actual Unit Cost	Actual Total Cost	Total Gain On Estim.	Unit Gain On Estim.	Total Loss On Estim.	Unit Loss On Estim.
1948											
Aug. 15	General Expense			$ 2,500.00			$ 2,300.00	$200.00		$	
	Gen'l Excavating	1,500cy	1.50	2,250.00	1,562cy	1.60	2,499.20			249.20	.10
	Trench Excavating	192cy	2.00	384.00	168cy	1.92	322.56	61.44	.08		
	Conc. Foundations	510cy	1.50	765.00	518cy	1.65	854.70			89.70	.15
	Conc. Forms	3,700D¹	.08	296.00	3,621D¹	.07	253.47	42.53	.01		
	Cement Flr. Basement	2,520D¹	.15	378.00	2,576D¹	.12	309.12	68.88	.03		
	Common Brick	115M	15.00	1,725.00	126M	15.00	1,890.00			165.00	
	Common Labor	115M	9.00	1,035.00	126M	9.76	1,229.76			194.76	
	Press Brick	42M	30.00	1,260.00	40M	30.00	1,200.00	60.00			
	Reinf. Concrete	1,250cy	9.00	11,250.00	1,192cy	8.71	10,382.32	867.68	.29		
	" " Labor	1,250cy	2.25	2,812.50	1,192cy	1.97	2,348.24	464.26	.28		
	" " Forms	71,000D¹	.08	5,680.00	69,251D¹	.07	4,847.57	832.43	.01		
	" " Labor	71,000D¹	.06	4,260.00	69,251D¹	.06½	4,501.32			241.32	.005
	Partitions	40,000D¹	.08	3,200.00	39,200D¹	.07¾	3,038.00	162.00	.0025		
	" Labor	40,000D¹	.05	2,000.00	39,200D¹	.04½	1,764.00	236.00	.005		
	Rough Carpentry			7,500.00			7,322.00	178.00			
	Mill Work			5,600.00			5,320.00	280.00			
	" " Labor			2,600.00			2,715.00			115.00	
	Plastering			4,500.00			4,721.00			221.00	
	Painting			3,600.00			3,220.00	380.00			
	Sheet Metal			4,200.00			4,350.00			150.00	
	Roofing			1,250.00			1,215.00	35.00			
	Glass & Glazing			2,170.60			2,095.00	75.00			
	Steel Sash			1,800.00			1,650.00	150.00			
	Plumbing			2,200.00			2,065.00	135.00			
	Heating			1,572.00			1,500.00	72.00			
	Wiring			965.00			1,000.00			35.00	
	Elevators			5,000.00			5,000.00				
				$82,752.50			$79,913.26	$4,300.22		$1,460.98	

Exhibit 7

order and fully covers the purchase order, the delivery ticket should be approved by the supervising foreman or timekeeper, attached to the purchase order copies, and forwarded to the cost accountant to await receipt of the invoice from the vendor.

Material Cost Recording

Upon receipt of the vendor's invoice, the purchase order copies and delivery ticket should be attached thereto. The invoice should then be checked against the purchase order and delivery ticket for quantities. Extensions should be checked as well. If everything is in order, the invoice may be approved by the cost accountant for payment through the general accounting channels. Clearance through the cost accountant gives him the green light to proceed with the keeping of material costs on the project under construction.

The form in which these costs are accumulated from invoices is shown in Exhibit 5, known as the Material Cost Record. This gives all the necessary data for keeping of material costs on a project. Of course, the headings vary among projects and are added to as a project proceeds to the completion stage. However, by analysis of invoices and supporting documents as related to the various classifications of work, it is possible to arrive at reasonably accurate total material costs for each classification and also useful unit material costs for these categories. As a whole the material cost record may be said to be self-explanatory.

Carrying out of this portion of cost accounting in the construction industry lies pretty completely with the cost accountant, but here again the cooperation of the supervisory forces on the job site is vital as all the data, as far as materials ordered at the job site is concerned, must be forwarded to the cost accountant in an accurate form. For this reason, the cost accountant should oversee the related procedures as with those underlying the reporting of labor costs.

General Ledger Account for Each Job

We have not entirely finished with cost analysis but it appears in order to mention here the ledger record for each job. Exhibit 6, known as the Job Cost Record, gives the cost accountant an over-all cost picture of the entire project as of any date. It also acts as a control over the detail records of labor and material costs, which are considered as subsidiary cost records. The job

EXHIBIT 7

cost record is used for billing purposes as it contains the total cost of the project to date. It is flexible and can be used for both cost plus and fixed price contract projects. Both the face and the reverse of the form are shown in Exhibit 6. The face contains information on the cost of the project as initially signed for, the summary of the costs billed and, in a block at the bottom not shown in the exhibit, the summary of all costs at the completion of the project to determine whether or not a profit or a loss was realized on the contract as a whole. The reverse of the form includes separate columns for labor, material, subcontracts, miscellaneous, and total cost to date. This last figure is the control.

The job cost record is specifically the cost accountant's tool. It is his entire responsibility and represents his summary control for all costs on the project in question.

Job Comparison Statement

Labor and materials as distributed, and unit data derived from the figures, as shown in Exhibits 4 and 5, are controlled by the ledger record just discussed, but they are given fuller use in the Job Comparison Statement shown as Exhibit 7 on which hypothetical figures show costs at the completion of the job next August. This statement affords classification of work performed. The comparison may be prepared weekly, monthly, or as preferred, and, of course, at the completion of the project. However, the comparison feature applies to fixed price contract work only. On cost-plus projects no comparison is available. Nevertheless, even without the estimated and gain or loss data in these cases, the recapitulation of all costs incurred, total costs, and unit costs of all operations performed is helpful for the data will be used in the preparation of future estimates. This record gives the company estimator a clearer picture of present-day costs under particular conditions, data of great interest to him.

In Brief

By diligently encouraging supervisory and timekeeping forces on a project to keep accurate and detailed records at the job site, as described above, the cost accountant will gain the principal goal he has tried to attain, accurate unit and total costs of each classification of work performed. By attaining this goal future operations will proceed on a more calculated basis, will be better coordinated and more likely to be profitable.

EXPENSE CONTROL BY RESPONSIBILITIES IN A RADIO BROADCASTING STATION

By GERALD W. SWANK,
Controller, Peoria Broadcasting Co.,
Peoria, Ill.

LIKE many other industries in the beginning, radio has just grown. In its younger days, it was operated without benefit of any particular guidance from accounting staff. Profit was hazily identified with money left at the end of the period. However, as our station grew in size and certain departments began to develop with a manager or department head assigned to each, questions of proper outlay inevitably came up. A few years ago it became apparent that organization lines should be drawn quite clearly and department heads made responsible for respective departmental expenditures.

Our thinking was speeded by introduction of the new method of broadcasting called frequency modulation, or FM. Although this method necessitates new and more expensive transmitters on a different frequency band (and new receivers on the part of the listeners) the reception is so much better that it appears only a matter of time before FM will replace AM as a method of broadcasting. To provide for expenses in prospect in connection with FM and television expansion, it became clear that it would be necessary to be able to forecast profitable operations for the next few years. This made operating expense control a real "must."

Expense Control Is Profit Control

As a practical matter, our only method of controlling the profitability of our operations is to control expenses. We sell and service time on the air. Income is more or less limited by the total available hours and the rates for these hours, being set at a level related to rates for other advertising media in the area, cannot be increased freely. Hence, our objective became to find the appropriate relationship of the various expenses to station activity. We kept in mind, too, that 60 per cent of all our expenses were for salaries. In the interests of simplicity and in what we feel is an essential reflection of the facts, we related all our departmental and detailed expenses to sales, ignoring other activity bases except as they may be considered informally in discussion of control problems.

Master Control Schedule

Activity Level → / NET SALES → (Year / (Mo.	50%	60%	70%	80%	90%	100%	110%	150%	1% Interpolation
	$187,500.	225,000.	262,500.	300,000.	337,500.	375,000.	412,500.	562,500.	
	15,625.	18,750.	21,875.	25,000.	28,125.	31,250.	34,375.	46,875.	
Exec. Vice. Pres. schedule	3,685.	3,911.	4,137.	4,363.	4,589.	4,815.	5,041.	5,945.	22.60
Controller's schedule	2,337.	2,459.	2,581.	2,703.	2,825.	2,947.	3,069.	3,557.	12.20
Promotion mgr.'s schedule	909.	1,093.	1,277.	1,461.	1,645.	1,829.	2,013.	2,749.	18.40
Com'l. mgr.'s schedule	2,998.	3,116.	3,234.	3,352.	3,470.	3,588.	3,706.	4,178.	11.80
Prog. mgr.'s schedule									
Director of engrg. schedule									
Total operating expense				(All figures are hypothetical)					
Net operating profit									
Per cent net operating profit (Break-even=80.7%)									

Exhibit 1

Commercial Manager's Control Schedule

Activity Level	50%	60%	70%	80%	90%	100%	110%	150%	1% Interpolation
900 Salaries-Commercial Administrative	445.	469.	493.	517.	541.	565.	589.	685.	2.40
901 Salaries-Salesmen's	1,305.	1,331.	1,357.	1,383.	1,409.	1,435.	1,461.	1,565.	2.60
902 Salaries-Merchandising	75.	95.	115.	135.	155.	175.	195.	275.	2.00
903 Salaries-Traffic	140.	146.	152.	158.	164.	170.	176.	200.	.60
904 Salaries-Continuity	735.	757.	779.	801.	823.	845.	867.	955.	2.20
905 Merchandising expense	100.	110.	120.	130.	140.	150.	160.	200.	1.00
906 Entertainment-Com'l.	30.	34.	38.	42.	46.	50.	54.	70.	.40
907 Traveling-Com'l.	143.	149.	155.	161.	167.	173.	179.	203.	.60
908 Misc. sales expense	25.	25.	25.	25.	25.	25.	25.	25.	
Total	$2,998.	$3,116.	$3,234.	$3,352.	$3,470.	$3,588.	$3,706.	4,178.	11.80

Exhibit 2

Construction of Control Charts

Accordingly we determined as nearly as possible what we regarded as normal sales in normal times and, taking this as 100 per cent, we began the work of constructing a chart which would tell us by detail categories and department totals what sales and expenses should be at 10 per cent intervals from 50 per cent to 150 per cent of normal. These sales figures, simply computed on the basis of the estimated normal figure, apply to the column headings of Exhibits 1 and 2 and supply a volume range sufficient to cover any reasonable changes in business level.

The problem, essentially one in variable budgeting, of arriving at standard expense estimates at the respective sales volumes was the real task. It will be noted that Exhibits 1 and 2 differ in very little else than expense side captions. Exhibit 2 is shown for the commercial manager's department and is prepared in comparable detail for all departments. The totals from these schedules are carried up to Exhibit 1 which thus constitutes the master control schedule standard expense amounts at the successive sales levels by each executive responsibility.

Naturally, the initial estimate of dollars of expense per month for each category was made at the normal or 100 per cent level. The determination of degree of variability of mixed fixed-variable expenses was made somewhat informally, with knowledge that graphic of algebraic solutions based on estimates at two separate activity levels are available for greater exactitude. The variability as determined is expressed in the one per cent interpolation column at the extreme right. The most important use of this column is to render our expense estimates completely flexible, permitting ready calculation of allowable expenses at any volume of sales.

Expense Control Report

The actual use of the standard data developed in the construction of Exhibits 1 and 2 is built up around the Expense Control Report shown as Exhibit 3. It is in the control influence of this report that the effectiveness of our procedures rests. The control schedules permit us to select any appropriate sales level to govern expenses of operations for a coming month and to insert this forecast level as a percentage in the heading of the report and the forecast dollar expenses at this level in the first money column. To do this, we need only a forecast of sales for the month in question. This forecast must necessarily be held to a period short

EXPENSE CONTROL REPORT

% Forecast Activity Level 120% Period Ending Dec. 31, 194—
% Actual Operating Level 120% Control For Promotion Mgr.
Responsibility of John Doe

Acct. No.	Account Name	Expense Allowed at Forecast Level	Limitation of Expense at Actual Oper. Level	Actual Expense	Variations Excessive in (Red) This Month	Variations Excessive in (Red) Year To Date
800	Salaries-Promotion	529.00	529.00	525.00	4.00	26.00
801	National Advertising	546.00	546.00	726.00	(180.00)	174.00
802	Local Advertising	603.00	603.00	616.00	(13.00)	(28.00)
803	Research & Surveys	278.00	278.00	75.00	203.00	551.00
804	Brochures & Publications	128.00	128.00	-0-	128.00	(354.00)
805	General Promotion Expenses	71.00	71.00	110.00	(39.00)	121.00
806	Miscellaneous	42.00	42.00	50.00	(8.00)	(56.00)
	(All figures are hypothetical)					
	Total	2,197.00	2,197.00	2,102.00	95.00	434.00

EXHIBIT 3

enough to be estimated with reasonable accuracy. We are perhaps in a better position to forecast revenue than companies in many other lines since all radio time is sold on a contract (one year or less). We keep a contract record showing the breakdown of each client's billing in advance by months. From this record a sales estimate is prepared six weeks in advance of each month. In addition to this, the controller confers with the commercial manager to estimate any income on contracts that are pending or anticipated and possible or anticipated cancellations of contracts.

Silent Control

Throughout the month each executive has his expense control report before him for guidance. At this time, it contains only the forecast level of sales and the allowable dollar amounts, at that level, of the detail expense categories within the department. Neither the sales level indication nor the related expense allowances are a strait jacket for the department head. He is free to conjecture, or perhaps to learn from another official, that sales will be more or perhaps less and to spend accordingly. He is free to save when saving can be achieved and overspend where it seems necessary. He knows that the *whole* picture will be taken into con-

sideration in any performance appraisal. Much more weight is given to the cumulative variance than the monthly figure. At the same time, he is never lacking in reliable reference figures which provide him with an unbiased judgment as to the proper general level of expenditures of different types. When at the close of the month the actual operating percentage is determined from actual sales and the allowances inserted in the second money column and compared with actual outlays posted in the third column, there is little likelihood that the variations disclosed by the final column will be overlarge or wholly unprepared for. For simplicity, Exhibt 3 shows an instance where forecast and actual activity is the same but this, of course, is not always so.

There is a basic dependence upon the accuracy of sales estimates and the cooperation received from department heads in controlling expenses. To date the results obtained have indicated that our sales and profit as estimated at the beginning of the year will vary by only a small percentage from the actual operating results to be disclosed at the end. The system, in substance, sets each department head up in a little business of his own. He is given a certain amount to spend and the freedom to use his own judgment as to how to get the best results. It is not necessary for him to go to the executive office for approval every time he wants to spend small sums. The completed control reports showing variances from allowable expenses at the actual level operated, are laid on the desks of the department heads and the executive officers on the fourth day after the close of the month. The overexpenditures shown in red clearly indicate where there is danger of going overboard, and these are discussed at round table meetings. We have found that in addition to the routine benefits of this system, it has helped to develop executive ability in the department heads. Also, as is often the case with new procedures, many benefits to the company have been realized which were not anticipated at the time the profit and expense control system was installed.